Revista Colombiana de Anestesiología
Colombian Journal of Anesthesiology
www.revcolanest.com.co

Scientific and Technological Research

Association between fibrinogen levels and the severity of postpartum haemorrhage☆

Victoria García Velásquez[a,*], Marco González Agudelo[b], Arturo Cardona Ospina[c], Ricardo Ardila Castellanos[d]

[a] Specialist in Obstetrics and Gynaecology, Critical Care Medicine and Intensive Care; Specialist at Women's ICU, Clínica del Prado, Medellín, Colombia
[b] Specialist in Internal Medicine, Critical Care Medicine and Intensive Care, Master in Epidemiology; Coordinator at Women's ICU, Clínica del Prado, Medellín, Colombia
[c] Specialist in Obstetrics and Gynaecology, Fetal Medicine, Maternal-Fetal Unit Coordinator, Clínica del Prado, Medellín, Colombia
[d] Specialist in Internal Medicine, Pulmonology, Epidemiology; Fellow in Critical Care Medicine and Intensive Care, UNAB, Colombia

ARTICLE INFO

Article history:
Received 24 April 2014
Accepted 25 December 2014
Available online 5 March 2015

Keywords:
Postpartum hemorrhage
Fibrin fibrinogen degradation products
Blood transfusion
Blood coagulation
Maternal mortality

ABSTRACT

Objective: To determine if the level of fibrinogen at the onset of postpartum haemorrhage is associated with bleeding severity and a higher number of complications; to determine outcome-related cut-off points.

Materials and methods: Secondary analysis of a cohort study conducted with 79 mothers admitted to the Intensive Care Unit between February 1st, 2012 and January 31st, 2013, with a diagnosis of postpartum haemorrhage, defined as all cases of blood loss greater than 1000 mL. Fibrinogen levels were measured at the onset of the postpartum haemorrhage. Fibrinogen values were compared between patients with severe obstetric bleeding and those with mild-to-moderate bleeding, in order to establish the correlation with severity of blood loss and complications.

Results: Overall, 24.1% of the patients showed severe postpartum haemorrhage compared to 75.9% of the patients classified as having mild-to-moderate haemorrhage. There were 12 complications (15.2%), including 9 cases of acute renal injury, 2 cases of disseminated intravascular coagulation, and one death, all of them only in patients with severe obstetric haemorrhage. Regarding the initial fibrinogen value, the AUC-ROC for fibrinogen levels and their relationship with the severity was 0.71, with a cut-off point of <200 mg/dL to predict severity (100% positive predictive value).

☆ Please cite this article as: García-Velásquez V, González-Agudelo M, Cardona-Ospina A, Ardila-Castellanos R. Asociacion entre el nivel de fibrinogeno y severidad en la hemorragia posparto. Rev Colomb Anestesiol. 2015;43:136–141.

* *Corresponding author at*: Departamento de Medicina Crítica y Cuidado Intensivo, Clínica del Prado, Medellín, Colombia. Carrera 50A #64-42 Unidad de Cuidados Intensivos Clínica del Prado.
E-mail address: victoriagarcia1982@hotmail.com (V. García Velásquez).

Conclusion: The initial fibrinogen level in obstetric postpartum haemorrhage is a predictor of severity that helps in alerting to the need for treatment in these patients.

Asociacion entre el nivel de fibrinogeno y severidad en la hemorragia posparto

Palabras clave:
Hemorragia postparto
Productos de degradación de la fibrina-fibrinógeno
Transfusión sanguínea
Coagulación sanguínea
Mortalidad materna

RESUMEN

Objetivo: determinar si el nivel de fibrinógeno al inicio de la hemorragia posparto se asocia con la severidad del sangrado y mayor número de complicaciones; además definir los puntos de corte que se relacionan con el desenlace.

Materiales y métodos: análisis secundario de un estudio de cohortes realizado en 79 madres que ingresaron con diagnóstico de hemorragia posparto, definido como todo sangrado mayor de 1000 mL, a la Unidad de Cuidados Intensivos entre el 1 de febrero de 2012 al 31 de enero de 2013. Los niveles de fibrinógeno se realizaron al inicio de la hemorragia posparto. Se comparó el valor de fibrinógeno entre las pacientes que presentaron hemorragia obstétrica severa contra las hemorragias obstétricas leve-moderada, y de esta forma se correlaciona el valor del fibrinógeno con la severidad de la hemorragia y las complicaciones presentadas en las pacientes.

Resultados: el 24,1% de las pacientes presentaron hemorragia posparto severa y se comparó contra el 75,9% de las pacientes clasificadas como leve y moderada. Se presentaron 12 complicaciones (15,2%), 9 fueron injuria renal aguda, 2 coagulación intravascular diseminada y muerte en 1 paciente, sólo en las pacientes con hemorragia obstétrica severa. En cuanto al nivel inicial de fibrinógeno, el AUC-ROC para el valor de fibrinógeno y su relación con severidad fue de 0,71 con un punto de corte < 200 mg/dL para predecir severidad (valor predictivo positivo 100%)

Conclusión: el nivel de fibrinógeno inicial en hemorragia obstétrica posparto es un predictor de severidad que ayuda a alertar el tratamiento en estas pacientes.

Introduction

Worldwide, in developed as well as developing countries, obstetric haemorrhage continues to be a significant cause or mortality.[1] Postpartum bleeding is the main cause, and atony accounts for 70% of cases and continues to be the main trigger of massive postpartum haemorrhage (PPH) and complications due to coagulopathy.[2]

The evaluation of postpartum bleeding includes clinical, haemodynamic and laboratory variables used to classify the severity[3] and assess patients that benefit from early massive transfusions[4] and admission to the intensive care unit, and women at risk of developing complications due to severe haemorrhagic shock. The most important cause of maternal mortality due to postpartum haemorrhage secondary to uterine atony is the inadequate use of transfusion therapy and insufficient intravascular volume replacement,[5] as well as inadequate bleeding control in patients that appear clinically "stable". Consequently, early identification of patients that may progress to organ dysfunction and increased risk to their lives is of critical importance.

Procoagulant activity increases two-fold towards the end of pregnancy and, therefore, when postpartum bleeding develops, thrombin and partial thromboplastin times may appear normal, masking patients that are evolving towards early coagulopathy. When fibrinogen values drop to <100 mg/dL they are associated with the loss of 1.4 blood volumes, establishing a relationship between fibrinogen values and the severity of postpartum haemorrhage.[6]

The objective of this study was to determine whether fibrinogen levels at the onset of postpartum bleeding are associated with the probability of maternal complications, and to define cut-off points related with the outcome.

Materials and methods

Secondary analysis of a cohort study[7] with data collected prospectively in an obstetrical Intensive Care Unit in mothers presenting with a diagnosis of postpartum haemorrhage between February 1st, 2012 and January 31st, 2013. Based on the records of that cohort of patients, fibrinogen levels on admission were evaluated and outcomes were correlated with the presence or absence of complications secondary to the haemorrhage upon discharge from the unit. Postpartum haemorrhage was defined as every blood loss greater than